

CHAPTER 1

GENERAL

1-1. Purpose and scope. This manual presents criteria for improving the structural quality and workability of soils used for base courses, subbase courses, select materials, and subgrades for pavements. It is applicable to all elements responsible for Army pavement construction at mobilization facilities.

1-2. Definitions. The following definitions are applicable to this manual.

a. Soils. The term "soils" refers to naturally occurring materials that are used for the construction of all except the surface layers of pavements and that are subject to classification tests to provide a general concept of their engineering characteristics. Also included are the materials normally used for base courses, subbase courses, select material layers, and subgrades. The soil classification system to be used in evaluating these characteristics is described in MIL-STD-619.

b. Stabilization. Stabilization is the process of blending and mixing materials with a soil to improve the pertinent properties of the soil. The process may include the blending of soils to achieve a desired gradation or the mixing of commercially available additives that may alter the gradation, change certain properties, or act as a binder for cementation of the soil.

c. Modification. Modification refers to the stabilization process that results in improvement in some property of the soil but does not by design result in a significant increase in soil strength and durability.

d. Additive. Additive refers to a manufactured commercial product that, when added to the soil in the proper quantities, will improve the quality of the soil layer. This manual is restricted to the use of portland cement, lime, lime-cement-fly ash, and bitumen, alone or in combination, as additives to stabilize soils.

1-3. Methods of stabilization. The two general methods of stabilization presented are mechanical and additive. The effectiveness of stabilization is dependent upon the ability to obtain uniformity in blending the various materials. Mixing in a stationary or traveling plant is preferred; however, other means of mixing, such as scarifiers, plows, disks, graders, and rotary mixers, have been satisfactory.

a. Mechanical stabilization. Mechanical stabilization is accomplished by mixing or blending soils of two or more gradations to obtain a material meeting the required specification. The soil

9 Apr 84

blending may take place at the construction site, at a central plant, or at a borrow area. The blended material is then spread and compacted to required densities by conventional means.

b. Additive stabilization. Two types of additive stabilization are chemical and bituminous. Chemical stabilization is achieved by the addition of proper percentages of cement, lime, fly ash, or combinations of these materials to the soil. Bituminous stabilization is achieved by the addition of proper percentages of bituminous material to the soil. The selection and determination of the percentage of additive to be added is dependent upon the soil classification and the degree of improvement in soil quality desired. Generally, smaller amounts of additives are required when it is simply desired to alter soil properties, such as gradation, workability, and plasticity, than when it is desired to improve the strength and durability sufficiently to permit a thickness reduction design. After the additive has been mixed with the soil, spreading and compaction are achieved by conventional means.